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ABSTRACT

The 114 physicians working for the Navajo Area Indian Health Service (IHS) in June 1976 were surveyed to determine what attracted and retained physicians to the Navajo area. Of the 114 questionnaires mailed, 90 were returned. Designed to obtain data on the physician's background, choice of location, and satisfaction with both community and work conditions, the questionnaire items were subjected to factor analysis. Data indicated that the physicians were generally young and married, had recently completed their internship and/or residency, were from small families of high socioeconomic status in an urban environment, were from all regions of the U.S. (particularly east of the Mississippi), and had little experience in rural areas (particularly in the Southwest). The strongest single motivator to locate and work in the area seemed to be altruism, followed by the attractiveness of the Navajo Nation and the Southwest. The area of most satisfaction was the physician-patient relationship. Also satisfying were the community and social activities, the professional role offered by IHS and the opportunity for career advancement, and the leisure opportunities and life style. Of greatest dissatisfaction were the hospitals' staffing, and the general hospital facilities and technology. Physicians who planned to stay were older, from a mixed experience with a slight tendency toward a lower socioeconomic background (based on their father's education). (NQ)

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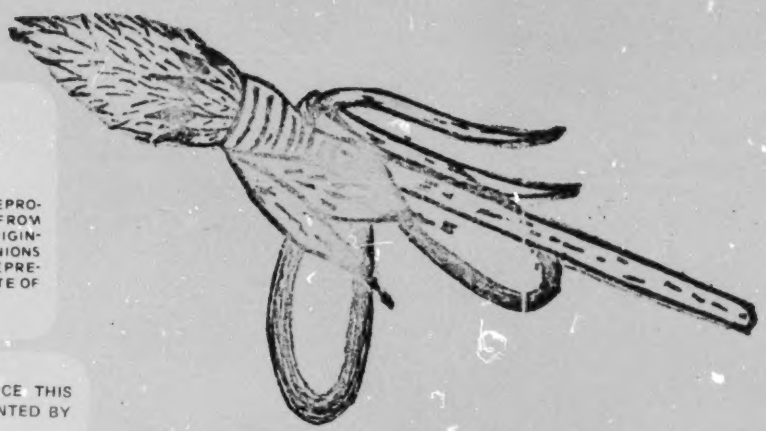
THE FEDERAL PHYSICIAN SURVEY FOR THE NAVAJO AREA: A PREDICTIVE MODEL FOR RECRUITMENT AND RETENTION



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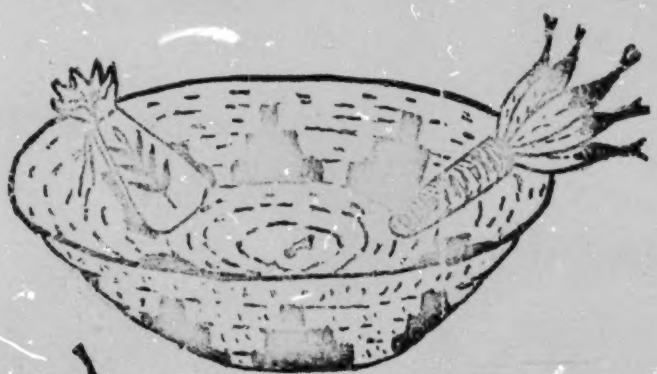

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The Federal Physician Survey for the Navajo Area: A Predictive Model for Recruitment and Retention

Area Health Education Center
Navajo Health Authority
Office of Health Statistics & Research
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In the analysis of the information Marty Austin coded all of the questionnaires for punching. All punching and processing was supervised and carried out by Susan Ciolek-Torrello, Cole Theis and Larry Manire of the University of Arizona Computer Center.

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Philip A. May, Ph.D.

Introduction

The recruitment and retention of physicians to work on Indian Reservations in the United States has been a problem for many years. Prior to 1955 reservations were served by Army and Bureau of Indian Affairs physicians and appropriations and positions were few. In 1955 jurisdiction was transferred to the Department of Health, Education and Welfare and staffing by the U.S. Public Health Service began. Allocation of resources and positions increased under this new arrangement and dramatic inroads were made in improving the Health status of U.S. Indians. But many problems remain, one of which is recruiting enough physicians for all of the allocated positions, and, more particularly, retaining them for periods of time longer than two years.

From 1955 through 1973 the U.S. Public Health Service was included in the physician draft system and shared a large pool of draftee physicians with the other uninformed services. Physicians had to fulfill their two years of military obligation, thus a captive audience was available to work in Indian Health facilities. Particularly during the Vietnam era, the Division of Indian Health enjoyed a large pool of applicants. Many physicians preferred the prospects of serving on an Indian reservation with the Public Health Service to that of working for another service and running the risk of serving in Southeast Asia. In this sense Indian Health assignments were highly sought by many physicians. Thus recruitment was not really a problem, but retention was low. Most physicians tended to leave after two years when their military obligation was completed. Reasons for leaving were various, but returning to a residency and going into private or a more lucrative practice were common reasons for departure.

With the end of the physician draft in July of 1973, recruitment became a problem for Indian Health Service; some areas of I.H.S. were more of a problem than others. For example 1973 and 1974 saw many physician vacancies in Aberdeen Area (mainly North and South Dakota) while other areas such as the Southwest were not as drastically affected. Presently the physician vacancy rate in the Navajo area is 8.7%. This translates to 11 of the 126 existing (public and private) positions (Navajo Health Authority, 1977b). In many ways this does not seem like a large problem, but when one considers that the Navajo area ratio of citizens to physician is 1200 to 1, this is a burden to the practicing physicians. In addition the retention of physicians in Navajo Area remains low with the average turnover being about 40% per year.

The significance of the current physician staffing situation is great. With over 8% of the physician slots unfilled at any one time, the already overworked Navajo Area physicians have an even greater load. In addition with a high rate of turnover, the efficiency and continuity of care is negatively influenced. Not only is it difficult to reorient new staff on a continual basis over the years, but the Navajo consumer seldom gets a chance to establish a long term relationship with a particular physician. Rapport with one's health care providers is an important part of an efficent and responsive delivery system.

Literature on Physician Distribution

There is a considerable amount of literature dealing with patterns and motivators of physician location. A number of hypotheses have been raised and variously tested to elicit how to better attract and retain physicians in underserved areas. These hypotheses of the existing literature are summed in the following:

(1) Physicians tend to gravitate to their community of origin. In other words they will practice in the area where they were raised or an adjacent area.

(2) Physicians with a rural background will be more likely to practice in a rural area and will also be more likely to take up family or general practice than to pursue a speciality as compared to physicians from an urban rearing.

(3) Physicians with wives from a rural background are more likely than others to practice in a rural area.

(4) The location of a physician's internship is influential on where he or she will practice. One study found 50% of all physicians later practiced within 200 miles of their internship.

(5) The more contact a person has within a state, the more likely he or she is to eventually practice there. More recent contacts are more influential than other contacts.

(6) Some of the impediments to practicing in a rural area are: the lack of contact with other health professionals, the lack of modern and specialized health facilities, and a perceived heavy workload with little opportunity for vacation.

(7) Advantages to rural practice are: clean air and unpolluted environment, the independence which can be gained in a rural practice, and a practice can be established more quickly than others.

All of the above findings were from studies which were carried out in non-reservation areas and concern themselves with private practioners. Few studies have been undertaken on federal physicians which deal with these same issues (for a more extensive literature review see Stewart, 1975).

One study was undertaken by Donald Boggs which dealt with factors of satisfaction and dissatisfaction among I.H.S. dentists. In rank order the satisfying factors were:

1. No limit to sick leave
2. Thirty days annual leave
3. Fulfillment of draft obligation
4. Station leave
5. Providing dental care to Indians
6. Social interaction with fellow workers
7. Fair and equitable supervision
8. Opportunities for promotion
9. Suitability of duties in IHS
10. Type of duty performed

Factors related to dissatisfaction were:

1. Wife's satisfaction with frequent moves
2. Pay
3. Paperwork and red tape
4. Availability of non-government housing
5. Dentist's satisfaction with frequent moves
6. Adequacy of schools for children
7. Indian consumer participation
8. Opportunities for long-term training
9. Maintenance of dental equipment
10. Headquarters implementation of Indian consumer participation

Boggs also found that some of the important variables reported in other studies were evident in the IHS dentists:

> "The study further indicates that the larger the town the dentist and his wife are from, the more education and income his family has, the less apt he is to stay in the service. Strong indications exist that dentists are more apt to make a career of the IHS if they are from rural areas and have families and parents with a low income and low educational attainment. Recruitment efforts probably should then be directed at smaller dental schools in smaller towns, preferably not from highly populated areas." (Boggs, 1976).

Another study done on I.H.S. employees dealt exclusively with physician recruitment (Hostetter and Felsen, 1975). Several methods of recruitment and advertisement for physicians were undertaken and the motivators of physicians to work for I.H.S. were analyzed. Major factors in joining I.H.S. were found to be prior contacts with I.H.S. or former I.H.S. personnel, mass media campaigns and an interest in American Indian Culture. Saturating the physician market place with positive information about I.H.S., recruitment visits to medical schools by I.H.S. personnel and appeals to indealism were approaches which seemed to be justified in future recruitment efforts.

Purpose of this Study

From the above, brief literature review, one might conclude that the knowledge concerning physician recruitment and retainment is by no means complete. Real guidelines regarding attraction and long term retainment have not been established. Therefore the purpose of the study is to establish a predictive model for both attracting and retaining physicians to the Navajo Area Indian Health Service. Such a model could serve as a basis for designing future efforts by Indian Health to attract and retain physicians. If efforts are refined which would allow for increased recruiting and retention of physicians, then the high vacancy rate and some other staffing problems would be lessened. In addition, if particular individuals are identified who are more suited by background and life experience to practice on the Navajo Reservation, then the frequency of turnover would decrease. In general, refined knowledge of the type of physician who can be recruited to the Navajo Area and who is satisfied with practicing here would be useful in health planning in many ways. Knowledge of these phenomena could also aid in these matters in other Indian Health areas as well as Navajo Area.

Methods and Procedures

The data contained in this study were collected by questionnaires (See Appendix A). The questionnaire items were designed to relate specifically to the background and current attitudes of the physicians in the Navajo Area. A second questionnaire was designed to measure similar items relating to physicians' spouses, but due to problems with clearance from the Office of Management and Budget of the federal government, it was not administered.

The sample consists of 90 questionnaires which were returned from the population of 114 physicians working for the Navajo Area Indian Health Service in

June of 1976. The return rate was therefore 78.9%. The questionnaires were distributed only once through the administrative officers or chief medical officers at each of the eight service units within Navajo Area. Return was voluntary and accomplished through the mail. No follow up attempt was made.

Once the questionnaires were returned, they were coded and transferred to 80 column I.B.M. (Fortran) sheets by the staff of the Office of Health Statistics and Research. Card Punching and computer processing were accomplished at the University of Arizona Computer Center in Tucson.

Results

Profile of the Navajo Area Physician

Some of the basic characteristics of the sample will be presented here as an introductory mechanism. While some results are obvious, all will serve to give one a better understanding and background of the type of physician being employed at present by the Navajo Area Indian Health Service.

Table one presents the data on the sex of all physicians in Navajo Area. As one would expect a vast majority (92%) of all physicians in Navajo Area are male. One wonders whether a change in the sex of physicians in Navajo Area would make any difference since the females presently practicing here seem to be well accepted by the Navajo.

Table 1: Sex of Physician Respondents
by Frequency and Percent

Sex	Number	Percent
Male	83	92.2
Female	7	7.8
Total	90	100.0

As far as age is concerned, the physicians are generally quite young. Table 2 shows the median age to be 32.8. The most common (modal age) age is 29. Thus the physicians practicing are very young, most having just finished their internship and/or residency. This is the most common pattern in all of Indian Health Service. Physicians are recruited right out of internship and residencies, they stay two years and then move on to further training and/or private practice.

Table 2: Age of Physician Respondents
by frequency and percent

Age in years	Number	Percent
27 - 29	26	29.0
30 - 34	27	30.0
35 - 39	12	13.3
40 - 44	8	8.9
45 - 49	4	4.4
50 - 59	2	2.2
60 and over	2	2.2
Unknown	9	10.0
	90	100.0
Median age = 32.75		
Mean age = 34.53		
Modal age = 29.0		

Table 3 gives a breakdown of the marital status of the Navajo Area Physicians. Over three fourths (76.4%) of the physicians are married indicating the need for supplying services for their spouses and families (i.e. family housing, schools). Although no question as to family size was asked the respondents, a question to be covered in a latter section deals with their satisfaction with community opportunities for their family.

Table 3: Marital Status of Physician Respondents
by frequency and percent

	N	%
single	16	18.0
married	68	76.4
other	5	5.6
	89	100.0

On an urban-rural basis, the Navajo Area physicians come from a background that is highly urban. Over 50% come from metropolitan areas of 50,000 persons or more while only 11.1% were from a rural area (See Table 4). This is not surprising, for medical students in general tend to overrepresent urban areas (Booker, 1977); however, as has been discussed earlier, rural backgrounds might be more suited to rural practice. The implications of the physician's background will be discussed in more detail later.

Table 4: Community Size of Physician's
Place of Birth by Frequency and Percent

Size	N	%	U.S. Population (1970)
Greater Metro Area (1 million or more)	21	23.3	9.2
Lesser Metro Area (50,000-999,999)	25	27.8	26.7
Small City (10,000-49,999)	19	21.1	19.3
Town (up to 9,999)	15	16.7	23.5
Rural Area (farm, ranch, reservation)	10	11.1	21.3
Total	90	100.0	100.0

* U.S. figures from Bureau of Census, Department of Commerce, Statistical Abstract of the U.S., 97th edition, Washington, D.C. U.S. Government Printing offices, 1976.

Table five summarizes the childhood origins of the physicians. The region of birth, birth to ten years of age, and age 11 to college are presented by both frequency and percent. A large majority of the physicians are

Table 5: Place of Birth, youth, and teens by Region for Physician Respondents by frequency and percent

Region	N Birth	N Youth (B-10)	N Teens (11-College)	% Birth	% Youth	% Teens
New England (Maine, N.H., Vermont, Mass., R.I., Conn.)	4	3	6	4.4	3.3	6.7
Middle Atlantic (New York, N.J., Pa.)	22	24	24	24.5	26.7	26.7
East North Central (Ohio, Ind., Ill., Mich., Wis.)	18	17	18	20.0	18.9	20.0
West North Central (Minn., Iowa, Mo., N.D., S.D., Neb., Kan.)	9	5	4	10.0	5.6	4.4
South Atlantic (Del., Md., D.C., Va., W.Va., N.C., S.C., Ga., Fla.)	10	9	6	11.2	10.0	6.7
East South Central (Ky., Tenn., Ala., Miss.)	3	5	4	3.3	5.6	4.4
West South Central (Ark., La., Okla., Tex.)	3	4	5	3.3	4.4	5.6
Mountain (Mont., Ida., Wy., Colo., N.M., Az., Ut., Nev.)	6	8	10	6.6	8.9	11.1
Pacific (Wa., Ore., Calif., Alaska, Hawaii)	10	11	9	11.2	12.2	10.0
Outside U.S.	4	4	4	4.4	4.4	4.4
Unknown	1	0	0	1.1	0.0	0.0
Total	90	90	90	100.0	100.0	100.0

from an Eastern U.S. background. Over 60% were born east of the Mississippi. Only 6.6% were born in the Rocky Mountain region of which the Navajo Reservation is a part. There is however, a slight trend for these physicians to have moved towards the Southwest during their childhood. Both the West SouthCentral and Mountain region show an increasing percentage from birth to college. While only 3.3% and 6.6% were born in thses regions 5.6% and 11.1% spent their teenage years there. This small trend is in agreement with the literature stating that most recent contacts with an area are strong in influencing location of practice. The high percentage of easterners, however, is the most prevalent pattern to these data possibly indicating that other factors enter into the choice of practice for Navajo Area physicians.

Only 4 (4.4%) were from foreign countries and all of these were born there. This is somewhat different than other areas of I.H.S. (i.e. Aberdeen) and the Veteran's Administration where foreign physicians have frequently been hired due to an inability to attract U.S. physicians.

The education level of the parents of Navajo Area physicians is high. The average person in the U.S. has slightly over 12 years of education while the parents in our sample (Table 6) are higher. 64.4% of all of the physicians fathers have at least some college while 35.6% hold a graduate degree. Similarly 57.8% of the mothers have some college and 17.8% have attended graduate school. Thus the parents of these physicinas are generally of a high socio-economic status. Regarding occupation of the father, 56.7% are classified as professional, technical or kindered workers. The most frequent occupations of the fathers are: physicians (14.4%), managers (5.6%), real estate salesman (5.6%), chemist (4.4%), lawyer (4.4%), teacher (4.4%), farmer (4.4%), college professor (3.3%), pharmacist (3.3%), and religious worker (3.3%). The most frequent occupation of the respondents' mothers is housewife (53.3%), while 15.6% were teachers, 5.6%

were secretaries, 4 (4.4%) were nurses, 1 (1.1%) was an optometrist and 1 (1.1%) was a physician.

Table 6: Parents' (Mother and Father) Education of Responding Physicians by frequency and percent

Education Level	Father	Mother	% Father	% Mother
8th grade or less	12	10	13.3	11.1
some high school	5	10	5.6	11.1
high school graduate	14	17	15.6	18.9
some college	11	18	12.2	20.0
college graduate	9	18	10.0	20.0
some graduate school	6	6	6.7	6.7
graduate degree holder	32	10	35.6	11.1
unknown	1	1	1.1	1.1
Total	90	90	100.0	100.0

These occupations and the education level indicate high socio-economic status of the physician's family of origin. This again is as expected for most physicians in the U.S. (Booker, 1977).

Regarding family size, the physicians were generally from a small family. The average number of children in the physician's family of origin is 2.8.

Education and Work Experience

Moving from the physicians' earlier years to their medical education and the experience of subsequent years, Table 7 provides a summary of the educational status of the respondents. Virtually all have finished their internships while only 61.1% have had some residency. How many have completed residency or are board certified is not clear. In addition, 35.6% have had a previous medical practice prior to coming to the Navajo Area while very few have

Table 7: Prior Educational Experience of Physicians on the Navajo Reservation

Experience Category	N	0/0
Completed Internship	88*	97.8%
Had Some Residency Training	55	61.1%
Prior Medical Practice		
1 previous	32	35.6%
2 previous	12	13.4%
3 previous	11	12.3%

* There was one "unknown" so the actual total might be 89 for only one listed no internship.

had 2 or more previous practices. Thus the profile of the young medical staff, recently out of training is again portrayed.

The employment status of the physicians deserves mention here. Indian Health Service professional employees are hired under one of two systems, commissioned corps of the Public Health Service or civil service. Each has its own advantages, but these advantages have vascilated in the past with the changing of pay scales and other policy. In the past Civil Service payed more, but with recent incentive and continuance pay given to physicians in P.H.S., the advantage is swinging the other way. Table 8 shows that 84.4% of all Navajo Area physicians are commissioned officers. This is somewhat but only slightly different from I.H.S. overall.

Community size where a person undertakes his education may exercise some influence on a person's choice of where to locate his practice; however, internship and residencies are only available in larger cities. Therefore, the data in Table 9 should be reviewed with this in mind. As one moves on to his/her

Table 8: Employment Status of Navajo Area Physician by frequency and Percent as Compared to all I.H.S. Physicians

Category	Navajo		All* I.H.S.	
	N	%	N	%
Commissioned Officer	76	84.4	424	80.0
Civil Service	11	12.2	106	20.0
No answer	3	3.3	—	—
Total	90	100.0	530	100.0

* Total I.H.S. information from U.S. Senate, 1976, p. 125

college, medical school, internship, etc., there is an increased pressure to move to more urbanized areas, for that is where the schools and/or hospitals are located. Nevertheless, from the college data it is apparent that the college expereince was predominatly urban. 75.5% of the physicians attended college in a urban environment (10,000 or more). All other levels of education were undertaken in the city, usually of large size.

Table 9: Community Size of Physician's College Education

Size	N			%		
	College	Internship	Residency	College	Internship	Residency
Greater Metro Area	22	45	34	24.4	50.0	61.8
Lesser Metro Area	25	40	17	27.8	44.4	30.9
Small City	21	2	4	23.3	2.2	7.3
Town	13	0	0	14.4	0.0	0.0
Rural Area	8	0	0	8.9	0.0	0.0
Unknown	1	3	0	1.1	3.3	0.0
Total	90	90	55	100.0	100.0	100.0

Turning to some other education data, Table 10 presents the location of various levels of the respondents' medical training. As can be seen, at most levels of training the location is various. In other words the

Table 10: Place of Medical School, Internship, and Residency of Navajo Area Physicians by Region, frequency and Percent

Region	N			%		
	Medical School	Internship	Residency	Medical School	Internship	Residency
New England (Main, N.H., Vermont, Mass., R.I., Conn.)	11	3	3	12.2	3.3	5.5
Middle Atlantic (New York, N.J., Pa.)	16	16	12	17.9	17.9	21.8
East North Central (Ohio, Ind., Ill., Mich., Wis.)	14	19	10	15.6	21.1	18.3
West North Central (Minn., Iowa. Mo., N.D., S.D., Neb., Kan.)	3	3	2	3.3	3.3	3.6
South Atlantic (Del., Md., D.C., Va., W.Va., N.C., S.C., Ga., Fla.)	9	7	5	10.0	7.8	9.1
West South Central (Ark., La., Okla., Tex.)	4	4	5	4.4	4.4	9.1
East South Central (Ky., Tenn., Ala., Miss.)	9	5	2	10.0	5.6	3.6
Mountain (Mont., Ida., Wy., Colo., N.M., Az., Ut., Nev.)	4	10	4	4.4	11.1	7.3
Pacific (Wa., Ore., Calif., Alaska, Hawaii)	12	19	10	13.3	21.1	18.3
Outside U.S.	7	2	1	7.8	2.2	1.8
Unknown	1	2	1	1.1	2.2	1.8
Total	90	90	55*	100.0	100.0	100.0

* 35 of the 90 physicins have not undertaken any residency.

regions of training for these physicians are fairly well spread over the U.S. This is especially true for internship where 11% have completed internships in the Mountain region. Nevertheless, this table again points out the variation of geographical background and experience of Navajo Area physicians. They seem to be drawn from all over the country and in many cases, from quite far away.

In summary of the results thus far, a profile has been established for the Navajo Area physician. They are generally from an urban environment, small family of high socio economic status, from all regions of the U.S. and particularly east of the Mississippi. There is little evidence of experience in rural areas and particularly the Southwest.

Choice of Location Factors

The previous sections of the results have generally described the background characteristics of the Navajo Area physicians in terms of their family and education. Now the analysis turns from the first part of the questionnaire to the second part which dealt with a series of items to elicit why the physician chose to come to Navajo Area Indian Health and whether or not he/she is s satisfied with particular aspects of work and life among the Navajo. This section will deal with the results of the choice of location items while the satisfaction items will be described in a later section.

Table 11 shows the response to the question "At what point did you decide to practice in your present location." The results point to the fact that decisions were generally made after medical school (72.2%). Most (27.7%) were made in a residency, while in a previous practice (23.4%) and internship (21.1%) were common. Thus, efforts to recruit physicians should be aimed at physicians in their internship and later rather than in college or in the earliest years

of medical school. The third or forth year would be the earliest point to start recruitment efforts.

Moving now to more sophisticated analysis, the next table, Table 12 deals with a detailed statistical analysis of all of the 17 items regarding the decision of where to practice medicine. The exact questions regarding location are listed in Appendix I on pages 6 and 7 of the questionnaire. The method used is factor analysis. In factor analysis the number and nature of underlying factors are determined or identified from a larger number of variables. In this case the variables are the 17 questions on location choice and factor analysis uses correlation to extract major trends or factors which appear in the responses to the items.

Table 11: The Point at Which the Decision to Practice on the Present Location was Made by Frequency and Percent

Educational Level	N	%
College or before	1	1.1
Medical School	15	16.7
Internship	19	21.1
Residency	25	27.7
In a previous practice	21	23.4
Other	9	10.0
Total	90	100.0

This is accomplished by correlating each individual item with every other item on location choice. Where several variables intercorrelate highly with one another, statistical clusters are produced which, when examined, indicate underlying similarities in the variables, i.e. they are answered in a similar way implicitly because of a strong belief in a particular ideal or a particular motivating factor (see Nie, et. al. 1975 or Kerlinger, 1973). Table 12 sum-

marizes the factors in both statistical and theoretical terms.

From Table 12 it appears that physicians have come to practice in the Navajo Area for at least five major reasons.* The reason or factor which has the strongest influence (or the highest statistical value) is a series of questions which deal with altruism. Essentially many physicians have come to Navajo Area because they felt they were needed here, they could be of greater service here then in other areas, their religion dictated it, and similar idealistic reasons. Altruism alone accounts for 17.2% of all of the variance in location choice. Therefore the physicians practicing in Navajo Area are an idealistic and altruistic group.

The second most important factor in location choice is the attractiveness of the location of the Navajo Reservation. This accounts for 13.9% of the variance. In general the location of the Navajo Reservation was attractive to the physician's spouse, the leisure activities were seen as positive and practice in I.H.S. was seen as an opportunity to build a economically productive practice in a short period of time. In this case the economics centered around the I.H.S. salary. Certainly, then, the area is attractive, but also economic attractiveness is important also.

As might be expected, friends and other persons are influential on practice location decisions. As factor 3 points out, the influence of friends and faculty members accounts for 11.2% of the choice on location.

As alluded to in the location attractiveness, practical decisions such as salary are important to physicians. Factor four indicates that there are other pragmatic factors involved. Personal health and going where one is actively recruited influence the decision of where to practice (9.3% of the variance).

* Only factors producing an Eigenvalue of greater than 1.00 were considered to be of significance.

Table 12: Choice of Location - Factor Analysis Results

Factor #	Name of Factor	Eigenvalue	Percent of Total Variance Explained	Factor loading	Var. No.	Description of Specific items in factor
1	Altruism	2.23155	17.2%	.67186	9	Serious shortage of physicians in the area
				.40291	10	Liked the Health care model used in community
				.49274	11	Community selected for reasons associated with religion
				.74339	12	It seemed I could be of most service to the community
2	Location Attractiveness	1.80867	13.9%	.58110	4	Spouse liked area very much
				.50358	6	Best opportunity to develop an economically productive practice in a brief time
				.66200	13	Attracted by the leisure opportunities of the area
3	Influence of	1.48499	11.4%	.62602	2	The positive influence of friends who know the area
				.62863	3	Recommendation of a faculty member
4	Pragmatism	1.21470	9.3%	.49430	5	Personal health or health of spouse or children were factors
				.58668	8	Actively recruited by the Indian Health Service
5	Economic	1.12451	8.7%	.48745	15	It was necessary for me to repay a loan payment by service
				-.23088	16	Reassignment

Total variance accounted for by these factors = 60.5%

Variance unaccounted for = 39.5%

The final factor again points out the economic scale of the location decision. 8.7% of the variance is accounted for by the fact that the physician had pressing financial matters or was reassigned to the area and who chose to stay with I.H.S. through the transfer.*

In sum there are several important findings from the factor analysis. First, many physicians are highly motivated by altruism and being of help to those who need medical assistance. Secondly, the Southwest is seen by this cohort of physicians as an attractive area for a variety of reasons particularly due to leisure and recreation opportunities. Third, friends, relatives, professors and other significant persons have an affect on the physician's choice of location. Fourth, economic gain and security are important in the decision. Each of these points could be covered extensively, taken into consideration, and emphasized in any recruitment and retention efforts.

Dependent Variable:
Plans to Stay in Indian Health Service

As originally designed, this project was to utilize multiple regression as a sole statistical predictor of length of stay in Indian Health Service. The dependent variable (Y) length of experience in I.H.S. was to be matched with a number of independent variables such as those described above, i.e. family, geographic, and educational background (Stewart, 1975). In the reorganizing and retyping of the questionnaire, however, the question asking for length of experience in I.H.S. was omitted. Therefore another questionnaire item and some other statistical factors will be utilized as dependent variables for regression analysis.

The one questionnaire item which lends itself to use as a dependent variable is the question: "Do you intend to practice indefinately in this

* Note that the factor loading is negative indicating that only a few physicians came to area due to reassignment and the others did not.

community (circumstances permitting)?" The results of this question are presented in Table 13.

Table 13: Physicians Answering Whether They intend to practice Indefinately in the Navajo Communities by frequency and percent

Response	N	%
Yes	24	26.7
No	61	67.8
No answer	5	5.5
Total	90	100.0

Over one-forth of the physicians answered that they planned to stay indefinately while the majority (67.8%) said no. The number answering "yes" is rather surprising since most physicians leave after two years. If one had a measure of length of previous experience in I.H.S., many of the "yes" answers would probably be from both some "new recruits" with one year or less experience as well as the actual career physicians. Nevertheless within the 26.7% who answered affirmatively to this question, there is a significant number of I.H.S. career physicians. In this sense it may be useful as a dependent variable.

More Dependent Variables: Satisfaction Indices

The final part of the physician questionnaire which will be described here deals with 21 items measuring the physician's satisfaction with both community and work conditions (see Appendix I, pages 7-9 of the questionnaire). These items were asked in a Likert Scale fashion in which the physicians stated that they were very satisfied, satisfied, undecided, dissatisfied or very dissatisfied with various specific conditions. The results were tabulated and

then subjected to factor analysis as described above with the choice of location items (See Table 14).

The first and most significant satisfaction factor proved to be the physician-patient relationship. On the whole Navajo Area physicians seem to be satisfied with their interaction with patients. This factor accounts for 22% of the total variance. Working in a cross-cultural situation can be both interesting and in some cases frustrating, but it appears to be a positive element with these physicians. Physicians in many other areas of I.H.S. might not be so satisfied with their patient relationships as the Navajo Area physicians seem to be.

Another satisfaction factor covers the area of community and social activities. The physicians report satisfaction with the environment for personal and family life, leisure activities, cultural and social activities and interpersonal relationships. Indeed, the personal relationships made by many I.H.S. personnel with fellow workers, community people, etc., are truly deep and lasting. Therefore, this is an item of satisfaction which accounts for 15.3% of the variance.

Of slightly less satisfaction than the above factors is the professional role which is demanded by I.H.S. Many of the physicians feel that they are advancing professionally, that the contacts with their colleages are fulfilling, and that they can remain reasonably current in their areas of speciality. It would be extremely interesting, if one had the available information, to find out if length of stay affected this factor. One would suspect that with many of the physicians the longer they remained in I.H.S. the less satisfied they might be in this area. Being recently out of school and applying what one has studied for many years is very exciting at first, but the feeling may wane. This might be especially true when working within a bureaucracy.

Table 14: Satisfaction with the Work and Community Environment - Factor Analysis Results

Factor #	Name of Factor	Eigenvalue	Percent of Total Variance Explained	Factor loading	Var #	Description of Specific items in factor
1	Physician-Patient Relationship	4.61770	22.0%	.65684	25	Satisfied with use of hospital services by patients
				.85557	26	Satisfied with quality of patient relationships
				.67293	27	Satisfied with degree of patient cooperation in medical care
				.64876	28	Satisfied with effect of cultural dynamics on patient care
				.50290	29	Satisfied with nature and type of medical problems seen
				.51236	30	Satisfied with adequacy of physician/patient communication
2	Community & Social Activities	3.20932	15.3%	.66107	31	Satisfied with environment for personal and/or family life
				.52500	35	Satisfied with leisure activities
				.80717	36	Satisfied with cultural and social activities
				.58621	37	Satisfied with interpersonal relationships in community
3	Professional Role & Career Maintenance	2.24011	10.7%	.49575	17	Satisfied with current professional role
				.67288	18	Satisfied with your own professional development
				.58943	19	Satisfied with ability to remain reasonably current in your area
				.83549	20	Satisfied with extent of contact with professional colleagues
				.87499	21	Satisfied with nature of contact with professional colleagues
4	Leisure and Life Style Opportunities	1.49322	7.1%	.79090	32	Satisfied with amount of time away from practice
				.48817	33	Satisfied with educational opportunities for self and family
				.55526	34	Satisfied with pace of life
				.47130	35	Satisfied with leisure activities
5	Hospital Staffing	1.37402	6.6%	.68088	22	Satisfied with hospital staffing situation
				.86566	23	Satisfied with specific service staffing situation
6	Hospital equipment	1.07391	5.1%	.63889	24	Satisfied with access to equipment and other medical technology

total variance explained by these six factors = 66.8% Total variance unexplained = 33.2%

A fourth factor, accounting for 7.1% of the variance is the satisfaction with leisure and life style activities. Most physicians are happy with their opportunities for leave, pace of life, educational opportunities, and leisure activities in general. They were less satisfied with educational opportunities and cultural opportunities than with the other items.

Continuing on to areas of decreasing satisfaction, one arrives at the areas of hospital staffing and hospital equipment. These two items only account for only 6.6% and 5.1% of the variance respectively. In general most physicians are dissatisfied with staffing and equipment and technology. A full 60.0% of all respondents were dissatisfied with hospital staffing and 40.0% with the staffing of other services while only 34.4% and 44.4% were satisfied. Likewise 42.3% were dissatisfied with the equipment and technology while 40.0% were satisfied. Thus this is the area of least satisfaction. Again it would be interesting to compare these results by length of stay in Indian Health Service.

In summary of the satisfaction factors, physicians were most pleased with their relationships with patients, community and social activities, their professional role and in some cases their opportunity for leisure and life style activities. They were least satisfied with hospital staffing and equipment. For recruitment the items of greatest satisfaction could be emphasized to the advantage of I.H.S. and the Navajo. But for retention, drastic improvement must be made in the staffing and equipment problems. These factors have been identified before in other sources (Navajo Health Authority, 1977b, 1977c), but they again are outstanding in this study as needing improvement. These two areas of least satisfaction, unlike many of the areas of satisfaction, are manipulable in that they are internal to the I.H.S. system. They are task-related and could be changed for the improvement of retention and the attraction of new physicians. If the patient relationships or community environment had been found to be un-

satisfactory they could not be changed as easily as increased staffing and equipment.

Further Analysis: Regression

At this point a number of major insights have already been gained regarding the factors involved in physician recruitment and retention. The factor analysis has proved to be particularly insightful. Nevertheless, this section will present some further analysis in the form of regression of selected scales and independent variables on several dependent variables.

In order to undertake regression analysis one must assume that his predictors are relatively independent (statistically) of one another. Among background variables there are few intercorrelations and most of these are low* (See Appendix B); thus they are relatively independent predictors of the chosen dependent variables of satisfaction and intention to practice indefinitely in the Navajo Community. Second, the location choice indices were derived through factor analysis; therefore they will be statistically independent of the types of satisfaction and intention to continue practice. Third, the satisfaction indices were derived from factor analysis and are independent of other variables and indices. Therefore, since all of the independent variables are (statistically) relatively independent, this will enhance the interpretation of the subsequent regression analysis. In addition, the number of significant correlations between the variables (background and choice of location factors) and each of the six satisfaction indices are few (Appendix B). Many of those zero-order correlations which are significant will be found to be spurious in subsequent regression analysis. Finally, the number of significant correlations between the independent predictors (background, location, choice, and satisfaction indices) and the intention to practice are few, and many of those which are significant in zero-order analysis will be found to be spurious in regression analysis. Thus, given this information one can safely proceed with regression.

* The two highest coefficients .65888 and .65719 are between community size of birth and college and mother's and father's education. These are measures which one would expect to find high correlations for they are somewhat redundant.

There are seven different regression models tested in this section. Each will be diagramed, tested, and then analyzed.

The first regression equation is as follows:

dependent variable = f independents X_1, X_2 ...X_n

$Y = f(X_1, X_2 \ldots X_n,)$

$Y = f$ (X_1 = Date of Birth
X_2 = Community Size-Birth
X_3 = Community Size-College
X_4 = City Size-Internship
X_5 = # of children in family
X_6 = Father's Education
X_7 = Mother's Education
$X_8 = X_{12}$ =(location choice indices)

(Scale 1: Physician Patient Relationship)

In this and all following equations, step-wise multiple regression is used and is tabulated by SPSS (Nie, et.al. 1975). Table 15 presents a summary of the regression using this model.

From Table 15 the R^2 value indicates that the independent variables tested are explaining 18.2% of the variance in satisfaction with the physician-patient relationships. Of most significance in predicting satisfaction in this area are the number of children in the physician's family of origin, the city size of internship, altruism, pragmatism and community size of birth. The smaller a physician's family of origin, the more likely he/she is to be satisfied with his relationships with Navajo patients. Regarding the city size of his/her internship, the smaller the city size of the internship, the more likely he/she is to be satisfied with patient relations. Regarding altruism, the more altruistic a person's reason for practicing among the Navajo, the more likely he/she is to be satisfied with patient relations; and the least pragmatic physicians tend to be most satisfied with patient relations while the inverse is true with pragmatic physicians. Finally, the smaller the community of birth and the older a physician is, the more satisfied he/she is with patient relationships. While each of these conclusions is insightful, the reader is reminded that other conclusions

Table 15: Regression Matrix for Satisfaction Scale 1, Physician-Patient Relationship, by Selected Variables and Factors

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variable
Father's Education	-.17950	-.175289	-.1396987 -70.93765	.9304	.338	2.51	13.82
Scale 10-Pragmatism	-.14994	-.490380	-.1546646 -.08460	1.9433	.167	2.32	12.78
City Size-Internship	-.13939	-.617616	-.2351733 86.70242	3.0607	.084	3.28	18.06
# of Children in family of origin	-.10779	-.202864	-.3621847 -73.06238	5.4864	.022	3.26	17.95
Scale 7-Altruism	.11497	.270949	.1626727 -.13480	2.1914	.143	1.87	10.29
Community Size-Birth	-.15814	-.384178	-.1831286 88.52261	1.5989	.210	2.89	15.92
Age	.15032	.437912	.1291288 -159.49624	1.0053	.319	1.94	10.68
Scale 8-Location Attractiveness	.01783	.160065	.0761040 .01713	.4983	.482	0.14	0.77
Scale 11-Economic	-.05135	.117979	.0237706 -.02456	.4628	.830	*-0.12	-0.66
Community Size-College	-.08122	.544948	.0249077 -12.08192	.3112	.860	*-0.20	-1.10
Mother's Education	-.12303	-.349678	-.0225144 -11.95055	.2508	.875	0.28	1.54

Constant B = 1.7620058 R^2 = .18158 Standard Deviation of R^2 = 2.65477

Variables not in the equation; Scale 9, Influence of Others

*Negative percents of variance explained indicate a supressor variable

can be drawn from Table 15 and that the independent variables only account for 18.2% of the total variance in the dependent.

Turning now to Table 16 which deals with satisfaction with the community and social enviroment, the equation being tested is similar to the previous equation except for the dependent variable (Y). It is as follows:

$$Y = f\ (X_1, X_2 \ldots X_n,)$$

Y = Satisfaction with community & social activities

$X_1 - X_{12}$ = Background variables and location choice indices

The interpretation of Table 16 is straightforward, but of less significance than the previous table. Only 8.8% of the variance in community satisfaction is being explained by the independent variables and only two of the variables approach significance: location attractiveness and pragmatism. Only 3.5% of the total variance (and 40% of the explained) is accounted for by the fact that the more attractive the location of the Navajo reservation is to the physician, the more satisfied with the community and social enviroment he/she is. Also of some significance is the fact that the more pragmatic a person is, the less satisfied he is with the local community and social scene.

Satisfaction with the professional role and career maintenance is the dependent variable in Table 17 and the equation which it is based upon is identical to the two described previously. Again little significance is shown by the F values or the significance levels; only 10.9% of the variance is explained in this table. Of most significance in predicting satisfaction with professional role are location attractiveness, community size of birth, pragmatism, date of birth, and altruism. The more attractive this area is to the physician the more likely he/she is to be satisfied with the professional role in I.H.S. The larger the community in which a physician was born, the more likely he/she is to be satisfied with the professional role in I.H.S. It seems some elements of the I.H.S. physician role (i.e. with elements of dealing with a large bureaucracy and serving an underserved

Table 16: Regression Matrix for Satisfaction Scale 2, Community and Social Environment by Selected Variables and Factors

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
Scale 8-Location Attractiveness	.16785	.275402	.2071618 .03906	3.3559	.071	3.48	39.68
Scale 10-Pragmatism	-.13819	-.386333	-.1683270 -.07714	2.1581	.146	2.33	26.56
Community Size-Birth	-.11191	-.123247	-.0811585 32.86727	.2771	.600	0.91	10.38
Scale 9-Influence of Others	.08892	.122449	.0634929 -.00547	.2832	.596	0.56	6.38
City Size-Internship	.02495	.740178	.0389330 -12.02582	.1007	.752	0.09	1.03
Father's Education	-.06588	-.626447	-.0689692 -29.34078	.2011	.655	0.45	5.13
Community Size-College	-.11246	-.107586	-.0679308 27.60582	.2001	.656	0.78	8.89
Scale 7-Altruism	-.00801	.406860	.0337446 -.02343	.8466	.722	0.03	0.34
Age	-.07640	-.769309	-.0313380 32.42875	.4929	.825	0.24	2.74
Scale 11-Economic	.01451	-.677258	-.0188504 .01632	.2602	.872	-0.03	-0.34
Mother's Education	-.00299	+.219822	+.0195523 8.69475	.1614	.899	-0.01	-0.11

Constant B = .58683593 R^2 = .08771 Standard Deviation of R^2 = 2.02895

Variables not in the equation; Variable 10, # of children in family of origin

Table 17: Regression Matrix for Satisfaction Scale 3, Professional Role and Career Maintenance, by Selected Variables and Factors

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
Scale 8-Location Attractiveness	.18521	.35835	.1987476 .04955	3.0839	.083	3.68	33.53
Scale 7-Altruism	.13484	.150075	.1051030 -.09649	.8276	.366	1.42	12.94
Community Size-Birth	.13761	.324251	.1802967 -96.55412	1.3766	.244	2.48	22.59
Community Size-College	.01610	-.215662	-.1149831 61.79044	.5793	.449	-0.19	-1.73
Scale 10-Pragmatism	-.04176	-.333129	-.1225611 -.07427	1.1074	.296	0.51	4.65
Age	.10208	.423775	.1457652 -199.46482	1.0779	.302	1.49	13.58
Scale 9-Influence of others	.09581	.241689	.1058219 -.01206	.7954	,375	1.01	9.20
City Size-Internship	-.00423	.148654	.0660279 26.96842	.2164	.643	-0.03	-.27
Scale 11-Economic	-.06244	-.185336	-.0435586 .04985	.1405	.709	0.27	2.46
# of children in family of origin	+.03656	+.234362	+.0407226 10.90791	.9039	.764	0.15	1.37
Mother's Education	+.01453	+.753795	+.0566146 33.29201	.1369	.712	0.08	.73
Father's Education	-.02182	-.449229	-.0417625 -23.49396	.7439	.786	0.09	.82

Constant (B) = -2.1453400 R^2 = .10974 Standard Deviation of R^2 = 2.38900

area) might be more suited to an urban background. Pragmatism is negatively related to satisfaction of the professional role; therefore, the more pragmatic a person is, the less satisfied he/she is with their role. Two final variables worth mentioning are both positively related to satisfaction; the more altruistic a person is, the more likely he/she is to be satisfied with the professional role of I.H.S. and the older one is, the more likely he/she is to be satisfied with his role.

Satisfaction with hospital staffing is the dependent variable tested in Table 18. The reader should recall from the factor analysis that this was an area of little satisfaction to the physician. Three variables proved to be of some significance: age, influence of others and the community size of birth. Two particular types of physicians seemed to be satisfied with the staffing of the hospitals and clinics, the older physicians and those born in larger communities. Those who chose to practice in the Navajo Area due to the influence of others were also more satisfied. Of those who were least satisfied, altruists and physicians from a large family background were represented. It is interesting to note that the older physicians were more tolerant of the staffing while the younger ones are not. As might be expected, the older ones have dealt with these problems longer and have learned to deal with them. This regression equation accounted for 17.7% of the variance in the dependent variable.

In Table 19 the satisfaction with the leisure and life style of physicians is described and the variables account for 15.3% of the variance. The most significantly satisfied persons are those who were influenced by others to enter I.H.S. in Navajo Area. It appears that those with a personality that is suited to life among the Navajo, influence friends of a similar disposition to enter I.H.S. and the friends themselves are happy. Physicians from large families also

Table 18: Regression Matrix for Satisfaction Scale 4, Hospital Staffing, by Selected Variables and Factors

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
Age	.22852	.542979	.3147935 -374228.94651	5.7318	.019	7.194	40.57
Scale 9-Influence of others	.17403	.337963	.2494088 -.24.70236	4.8437	.031	4.340	24.48
Community Size-Birth	.16442	.263035	.2465148 -114689.91325	2.8255	.097	4.053	22.86
Scale 11-Economic	.00003	.268723	.1064494 -105.8 534	.9226	.340	0.000	0.00
Father's Education	-.08719	-.893735	- .1400399 -68441.63328	.9189	.341	1.221	6.89
Scale 8-Location Attractiveness	-.05415	-.103541	-.0967903 -20.96334	.8207	.368	0.524	2.96
Community Size-College	.02486	-.111857	-.1005190 46928.26515	.4861	.488	-0.249	-1.40
Mother's Education	-.01609	+.609735	+.0771863 39432.19620	.2791	.599	-0.124	-0.69
# of children in family of origin	+.07743	+.277771	+.0813504 18930.63882	.4133	.522	0.629	3.55
City Size-Internship	-.03468	.922868	.0690900 -24515.60718	.2729	.603	-0.239	-1.35
Scale 7-Altruism	.10485	.309435	.0365259 -29.13112	.1109	.740	0.383	2.16

Constant (B) = -2.8915332 R^2 = .17731 Standard Deviation of R = 1.35378

Variables not in the equation; Scale 10, Pragmatism

Table 19: Regression Matrix for Satisfaction Scale 5, Leisure and Life Style Opportunities, by Selected Variables and Factors

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
Scale 9-Influence of Others	.17284	.328388	.2305555 3.07237	3.9682	.050	3.985	26.063
Father's Education	-.16025	-.132956	-.1981977 13032.84310	1.7609	.188	3.176	20.771
# of children in family of origin	+.16799	+.783941	+.2184248 -6838.79396	2.733	.102	3.669	23.996
Community Size-Birth	.10093	.230521	.2055353 12865.91437	1.880	.174	2.074	13.564
Community Size-College	.00142	-.113233	-.0968059 -6080.79140	.4315	.513	-.014	-.092
Scale 11-Economic	.06738	.264635	.0997314 13.34236	.7743	.382	0.672	4.395
Age	.09975	.258494	.1425733 22804.57266	1.0838	.301	1.422	9.300
City Size-Internship	.00333	.172699	.1230024 5872.36457	.7891	.377	0.041	0.268
Scale 7-Altruism	.00758	-.532218	-.0597678 -6.41350	.2813	.597	-0.045	-0.294
Scale 12-Pragmatism	.10439	.640738	.0377999 -2.67756	.1107	.740	0.395	2.583
Mother's Education	-.07639	+.342741	+.0412773 -2837.22732	.7647	.783	-0.315	-2.060
Scale 8-Location Attractiveness	.09557	.270905	.0240929 -.70207	.4763	.828	0.230	1.504

Constant (B) = -1.8395432 R^2 = 15290 Standard Deviation of R^2 = 1.45329

seem to enjoy the life style of the reservation as do those born in large cities. Two other conclusions form Table 19 deserve mention. The father's education item indicates that those from a higher socioeconomic status tend to be less satisfied with the life style and the age variable indicates more favorable response among the older I.H.S. physicians.

The final scale to be used as a dependent variable is satisfaction with the hospital equipment and technology. Table 20 presents the results. The overall prediction of the independent variables accounts for 18.9% of the total variance. Age accounts for almost half of this variance in that older physicians are more satisfied with the equipment than younger physicians. Again, the longer a person is in I.H.S., might make him/her more satisfied with or tolerant of existing facilities. A second indicator of satisfaction is location attractiveness. Those who find the Navajo Reservation and the Southwest an attractive area are more likely to be satisfied, and as has already been pointed out this also correlates with role satisfaction. Finally those who come from a small family background tend to be more satisfied with the existing medical facilities. Other variables show little or no influence on satisfaction with facilities. As was pointed out in the factor analysis, more physicians were dissatisfied with facilities and staffing than any of the other variables.

The final regression to be presented here to end all analysis is larger and more comprehensive than previous regressions. The formula being tested here is similar only a variable rather than a scale is used as the dependent variable and 18 dependent variables are utilized rather than 12 as in the previous regressions.

Intention to practice indefinately in the present community = f ($X_1 - X_7$ = Background Variables; $X_8 - X_{12}$ = Location of choice variables; $X_{13} - X_{18}$ = Satisfaction indices)

Thus the equation has been further expanded. One should be aware, however,

Table 20: *Regression Matrix for Satisfaction Scale 6, hospital equipment a* and technology, by Selected Variables and Factors

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
ge	.26277	.221538	.3300837 .357128703E+15	7.0859	.009	8.674	45.826
of children in amily of origin	-.10094	-.267522	-.2013561 .426441615E+14	3.3871	.069	2.032	10.736
cale 8-Location Attractiveness	.14941	.883498	.2122541 -.418382938E+11	3.9821	.049	3.171	16.754
cale 7-Altruism	.16757	.367176	.1113882 .808507103E+11	1.0671	.305	1.867	9.864
other's Education	+.00803	+.332603	+.1082076 -.503104140E+14	.9470	.333	.087	.459
cale 10-Pragmatism	-.01888	-.602437	-.0960083 .460017753E+11	.8047	.372	.181	.956
ommunity Size-College	.10530	.212917	.0491730 .208930594E+14	.1219	.728	.518	2.737
cale 11-Economic	-.15432	-.862905	-.0878483 -.794970993E+11	.6450	.424	1.356	7.164
ommunity Size-Birth	.15187	.234834	.0565618 .239494034E+14	.1664	.684	.859	4.538
cale 9-Influence of Others	-.07463	-.129204	-.0245048 -.220885805E+10	.4910	.825	.183	.967

Constant (B) = 1.0224363 R^2 = .18927 Standard Deviation of R^2 = .51960
Variables not in the equation: Var. 12, Father's Education and Var. 19, City Size-Internship

that given only 90 cases as in this study, this is a large number of independent variables.

Table 21 indicates that this equation allows one to account for 34.2% of all the variance in whether or not the physicians plan to stay in practice among the Navajo. By far the best predictor of retention in this equation is age. The older a physician is, the more likely he/she is to answer positively. This is not surprising for those who are older have already committed themselves for a longer period of time or at a later period of their life. The second most powerful predictor is physician-patient relationship. Those who are most satisfied with their patient relationships tend to plan on staying indefinitely. Similarly those who were most strongly motivated by altruism in their location choice are planning to stay in their present location for an indefinite period. The economic motive does not appear to be a major factor in remaining to practice among the Navajo. Those motivated strongly by economic factors when originally coming to the Navajo reservation are less likely to plan on staying. Thus there are two major satisfaction and location choice variables to which the physicians who expect to remain in Navajo I.H.S. react positively: physician-patiert relations and altruism. What then are their reasons for planning to remain? The motivator must be humanistic or altruistic values which are more powerful than economic considerations. While economic gains might bring some physicians to the Navajo reservation, these same physicians will probably leave for greater gain elsewhere. Most of those who plan on staying to practice indefinately are motivated by non-economic reasons.

Of somewhat less importance as predictors of retention are mother's education, satisfaction with professional roles and community size of birth and satisfaction with community and social activities. Those physicians whose mother has a high level of education are more likely to plan on staying while father's education is inversely related to staying. As one would expect being satisfied with the professional role influences people to stay, but because so few people in the

Navajo Reservation for Selected Variables and factors

riable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
e	.35308	.1635E-01	.297815 -2.56265	4.9624	.029	10.52	30.77
ale 7 altruism	.29004	.4566E-01	.1693695 -.00098	2.5417	.115	4.91	14.36
ale 1-physician patient relationship	.26545	.3438E-01	.2124066 .00148	3.8457	.054	5.64	16.49
ale 11 economic	-.27063	-.1449E-01	-.1803714 .00130	2.8465	.096	4.88	14.27
mmunity size-Birth	.14407	.3952E-01	.1088142 -.36644	.3542	.459	1.57	4.59
ale 2-Community & Social Activities	.10870	.2507E-01	.1120934 .00093	.9235	.340	1.22	3.57
ther's education	.01238	.5020E-01	.1996567 .73829	2.1025	.151	.25	.73
ther's education	-.09771	-.2059E-01	-.1013532 .35854	.5231	.472	.99	2.89
ale 3-professional role and career maintenance	.10049	-.2331E-01	-.1234260 -.00078	1.1908	.279	-1.24	-3.63
ale 6-hospital equipment	.25555	.5354E-01	.0654577 -.00000	.2603	.611	1.67	4.88
ale 5-leisure & educational opportunities	.14288	.3295E-01	.1088261 -.00001	.8197	.368	1.55	4.53
of children in family origin	-.01976	-.1129E-01	-.1038705 -.17496	.6154	.435	.21	.61

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Table 21 (cont.)

Variable or Factor Scale	r	B	Beta Elasticity	F	Significance level	% of total variance	% of explained variance
mmunity size-college	.12208	.2369E-01	.0668895 -.22603	.2386	.627	.82	2.39
al 8-location attractiveness	.03568	.1885E-01	.0553536 .00009	.2503	.618	.19	.56
mmunity size- internship	-.10467	-.1673E-01	-.0393577 .10109	.9044E-01	.764	.41	1.19
ale 9-influence of others	-.00879	.1206E-01	.0279536 -.00002	.6091E-01	.806	-.02	-.05
ale 10-pragmatism	.00657	-.1601E-01	-.0312032 -.00012	.8234E-01	.775	-.02	-.05
ale 4-hospital staffing	.18453	.1110E-01	.0348893 .00000	.7554E-01	.784	.64	1.87

Constant B = 1.0259574 R^2 = .34188 Standard deviation of R^2 = .40390

study plan to stay, this item acts as a supressor variable and has a negative % of explained variance. Most physicians who plan to stay in the Navajo area were born in larger communities. Finally being satisfied with the local community and social activities is a positive retention factor.

Summary and Conclusions

In summary of these data one can only say that a great number of conclusions could be reached from the varying statistical measures employed. The descriptive results were insightful in that the Navajo Area physicians seem to come from all over the United States and their experience is in various regions of the country. They are predominately young and have recently completed their internship and/or residency. They are predominately from small families of higher socioeconomic standing and most are married.

The choice to enter I.H.S. and practice in the Navajo Area generally was made after medical school so recruitment efforts prior to the third or fourth year of medical school would not be warranted. The strongest single motivator to locate and work in Navajo area seems to be altruism, followed by the attractiveness of the Navajo Nation and the Southwest. Other motivators to locate include the influence of friends, some pragmatic reasons and economic gain or security.

The physicians' areas of satisfaction and dissatisfaction were also explored. The area of most satisfaction was the physician-patient relationship. Also satisfying were the community and social activities, the professional role offered by I.H.S. and the opportunity for career advancement and the leisure opportunities and life style. Of greatest dissatisfaction were the staffing of the hospitals and other facilities and the general hospital facilities and technology.

Regression analysis yielded varying results which provide further insight into satisfaction and motivators for retention. Those who were satisfied with

the physician-patient relationship were from a small family, altruistic, born in a small community, older and had interned in a small community. Satisfaction with community and social activities centered around feeling that the area was attractive and was negatively related to pragmatism. Those satisfied with the professional role and career opportunities provided by I.H.S. felt this was an attractive area, were born in an urban area, were not pragmatic, but were older and altruistic. Hospital staffing was generally an area of dissatisfaction but those who were satisfied in this area were older, of urban birth and located in this area and I.H.S. due to the recommendation of a friend or faculty member. The leisure opportunities and life style of the area appealed to older physicians from a large family background, and had located here due to area attractiveness.

Of all of the physicians 26.7% stated that they planned to practice in this community indefinitely. Factors related to this decision were analyzed and a number of motivators were elicited. Older physicians were more likely to answer affirmatively. Of those who do plan to remain, satisfaction with the physician-patient relationship and the physician role and career opportunities were positive factors. In addition these same physicians were ones who came for altruistic reasons. They appear to be physicians from a mixed experience with a slight tendency towards a lower socioeconomic background (based on father's education) than the other physicians who do not plan to remain.

From the large quantity and variety of data and analysis presented, then, it appears there are two different types of physicians who practice in Navajo area. The most common (type 1) is the young, urban born and trained physician who is motivated by a variety of factors form and a desire to serve where he/she is needed to location attractiveness to economic. Service in this area is for a short period of time to carry out his/her altruistic feelings and serve the

local people while at the same time making an adequate and secure economic existence. This is usually their first job out of internship and/or residency. This person sees the interaction with the local community, culture and other attractions of the area as positive factors and/or "fringe benefits" of his stay in Indian Health Service in spite of being less satisfied than career physicians with his/her I.H.S. employment. But this type of physician generally has roots and plans for other areas of the U.S. and he moves on. Whatever the motivation of this type of physician (i.e. fulfill draft or scholarship obligations, serve a medically underserved area), his/her stay is for a short period of time.

The other type of physician (type 2) is motivated in most cases by similar reasons and accounts for approximately 20% of the physicians studied here. This person is older, is also born in a urban area but is making or plans to make a career out of Indian Health Service. This type of physician is motivated less by the economic attractions of Indian Health and is generally altruistic, satisfied or appreciative of the relationships shared with the patients, and find the community and social activities pleasing. Therefore, both types are altruistic and well intentioned, but those who stay (the second type) appear to be more motivated to stay or maintain this desire inspite of being somewhat dissatisfied with problems such as inadequate staffing and lack of facilities.

Whether these two types of physicians are distinquishable prior to several years of service is not clear, but the information contained in this paper has been used to approximate such a predictive model. Whether one of the two types of physicians described here is more efficient or suited for I.H.S. service is not clear. Certainly the second type of physician will stay longer, are older (and probably more experienced) and therefore improve the continuity of care and decrease turnover. But the first type of physician might add a unmeasure-

able "vitality" to Indian Health Care which enhances the health care delivered. In spite of slightly different motivators and time commitments among these types of physicians, they don't appear to be too highly different on the items in this questionnaire.

Practical Application

The implications of this study for I.H.S. recruitment are significant. Any of the factors relating to choice of location can be used in designing recruitment efforts. For example, appealing to the altruistic feelings of physicians along with realistic presentations of the leisure and life style opportunities of the reservation and the Southwest could be implemented through special pamphlets, books, and films. Billings Area of I.H.S. has had such a book written (Schultz, 1976). Similarly a number of the satisfaction items can be used for recruitment such as emphasizing the general satisfaction with the physician-patient relations to prospective recruits.

In general retention efforts, the two areas of least satisfaction need to be worked on by I.H.S. For the I.H.S. headquarters and the area offices, these should be a top priority. The staffing of I.H.S. facilities and the available physical facilities and technology are tremendous sources of frustration to all employees. Therefore, any upgrading of existing equipment and facilities and increase in staff would have a decided impact on the satisfaction of the physicians and possibly on their retention.

Various tribal organizations can play a part in attracting physicians and retaining them. Encouraging 3rd and 4th year medical students and residents to undertake field placements on reservations would be beneficial. These students may likely return. Increasing the knowledge of Navajo area opportunities among medical school faculties through various media could also help attract physicians to Navajo. All of this contact would make the area more attractive and increase awareness of the benefits of living and practicing here. Faculty would be in a

position to recommend employment here. In addition, by encouraging Indian students to enter medical professions (particularly medical school - M.D. and D.O.) through scholarships, education, counselling, etc., a new type of physician might be created. Rather than having physicians who are not very satisfied with the life style, patient-relations and social activities, Indian physicians who make a career of I.H.S. might be the opposite. Working with their own people on their own reservation may do more than satisfy them; it might excite them and result in high physician retention. However the same systemic frustrations (staffing, equipment, etc.) could also frustrate Indian physicians and negatively affect retention.

Further Research

In addition to the practical applications of this study, new insights were gained regarding any study of retention for I.H.S. First of all, factor analysis and multiple regression have been shown to be useful, analytic tools for this type of study. Their use has been helpful in more fully defining the elements involved in the perceptions of the physicians. Secondly, the use of these statistical techniques has enabled the researcher to more fully delineate how much of the total prediction (total variance) is actually being accomplished. With the largest and most complete regression equation, 34.2% of the variance in the plans to stay in I.H.S. was being predicted. While this is by no means an overwhelming amount explained, at least it delineates how much is being accomplished.

What then of the remaining 65% of the variance which is not accountable to the independent variables employed here? The third and final point to be made is that much of this may be simply due to the structual, normative, and other bureaucratic pressures of the Indian Health Service and medical profession in general. For example there are many structual pressures placed on a physician

in I.H.S. which have the effect of making him/her less powerful with less antonomy in determining his workload (i.e. can't limit his/her practice, can't set his hours or daily schedule, etc.) In this sense the normative structure might be unmeasureable using this type of attitudinal or background study. Among many physicians in I.H.S. (particularly the type 1 described above), there is a normative pressure which is strong which encourages physicians to plan on only two years and then move on to other types of practice and/or schooling. This may be a carry over from the days of the physician draft, but the normative pressure to be a doctor under more familiar surroundings (in a cultural and technological sense) or in private practice weighs on the physician's ultimate course. Working for a bureaucracy is not a dominant norm or ideal which is popular within the American Medical Association or many medical schools. Finally the bureaucratic policy of the Indian Health Service and the Commissioned Corps plays a role in non-retention in local communities. As a physician, dentist or other employee remains in I.H.S. for longer periods of time, he is constantly under pressure to "move up" and "assume a supervisory level" of duty. Many physicians who would be happy to remain a general practioner, surgeon or dentist at Chinle, Kayenta, Fort Defiance (or Tohola, Washington for that matter) have to "buck the system" or resist the pressure to "move up or get out." Once a physician has been in 3 or more years, there is pressure for him to become a service unit director, chief or staff, an area office administrator, or move to a larger service unit to a position of more responsibility. Thus the policy of the bureaucracy encourages frequent moves at a minimum. In many ways this type of policy may encourage non-retention, for a person might be forced from a position he/she enjoys and suited for to one which is not pleasing. Also he/she may be forced (or strongly encouraged) to leave an area of choice and go to an area where he is not happy (i.e. the

Southwest to Alaska or vice versa). Therefore much of the explanation of recruitment and retention may not be explainable with a background/attitudinal study such as this. Any future studies should incorporate structural determinants in their prediction model.

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